Second Funders Forum

November 2, 2012 - Punta del Este, Uruguay

"GRiSP: Global Rice Science Partnership"

(Presentation by Bas Baouman)

Document presented for Agenda Item 3:
CGIAR Success Stories and Research Impact

Submitted by:
GRiSP

GRiSP: Global Rice Science Partnership

Bas Bouman, GRiSP Director

CGIAR | Research Program on Rice

Global Rice Science Partnership

THE INTERNATIONAL RICE RESEARCH INSTITUTE 1960

Africa Rice Center

AfricaRice

CIAT

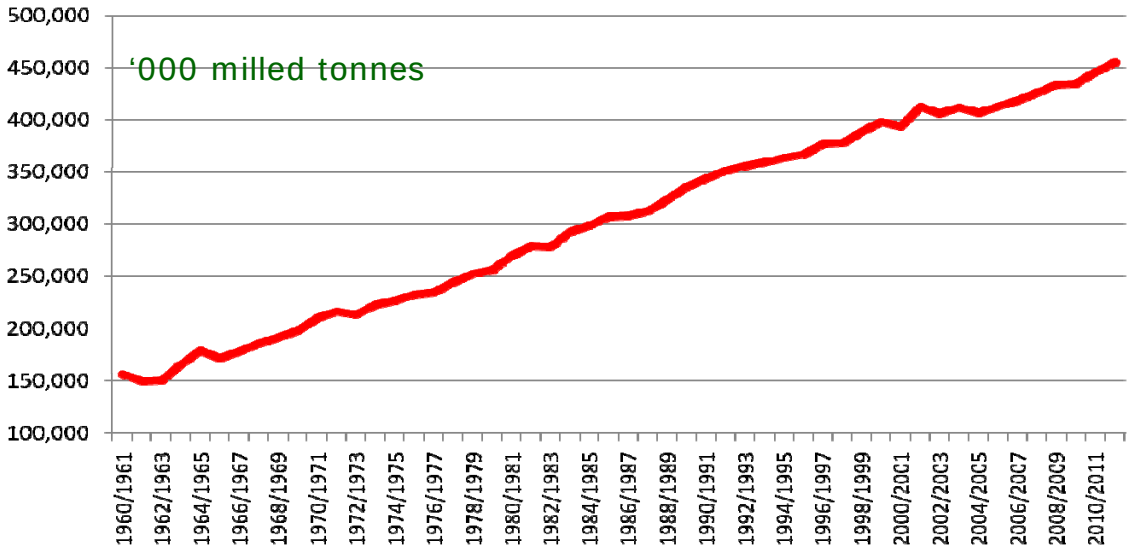
JIRCAS JAPAN

IRD

cirad LA RECHERCHE AGRONOMIQUE POUR LE DÉVELOPPEMENT

Why Rice – Why GRiSP?

- 120 million rice farmers feed 3.5 billion people
- 1 billion people extremely poor and 650 million hungry depend on rice – more coming…



No slowdown in global rice consumption

Rice fastest growing food commodity in SSA



=> Increase rice production that is affordable to poor and profitable to farmers (and value chain)

But… future: less and more expensive resources, more hostile environment (climate change)

Global challenge and global threats

⇒ concerted global action

⇒ GRiSP

Science partnerships

Development partnerships

Theme 1 ----- Theme 2, 3,4 ---------- Theme 5 Theme 6

GRiSP

Genes, varieties, management technologies, information gateway, models, data, tools, capacity, etc

Products locally adapted and promoted by public, NGO, and private sector

Products adopted by farmers, value chain actors, policy makers, other stakeholders

Increased nutritious rice production

Stable and affordable price of rice

Increased resource use efficiency

SRF

Food Security

Nutrition and health

Rural Poverty

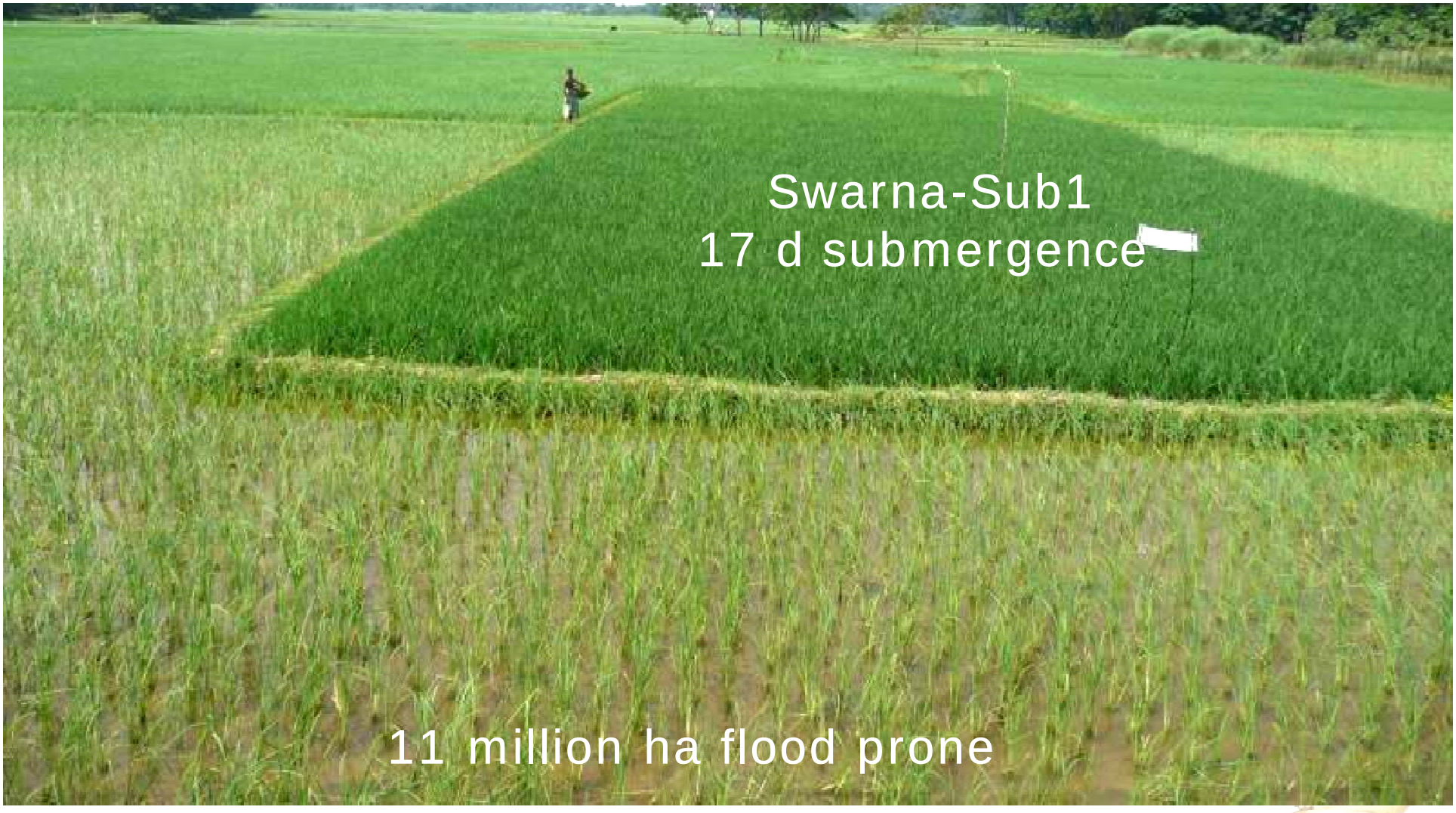
Sustainability

Products — Intermediate Development Outcomes — Impact

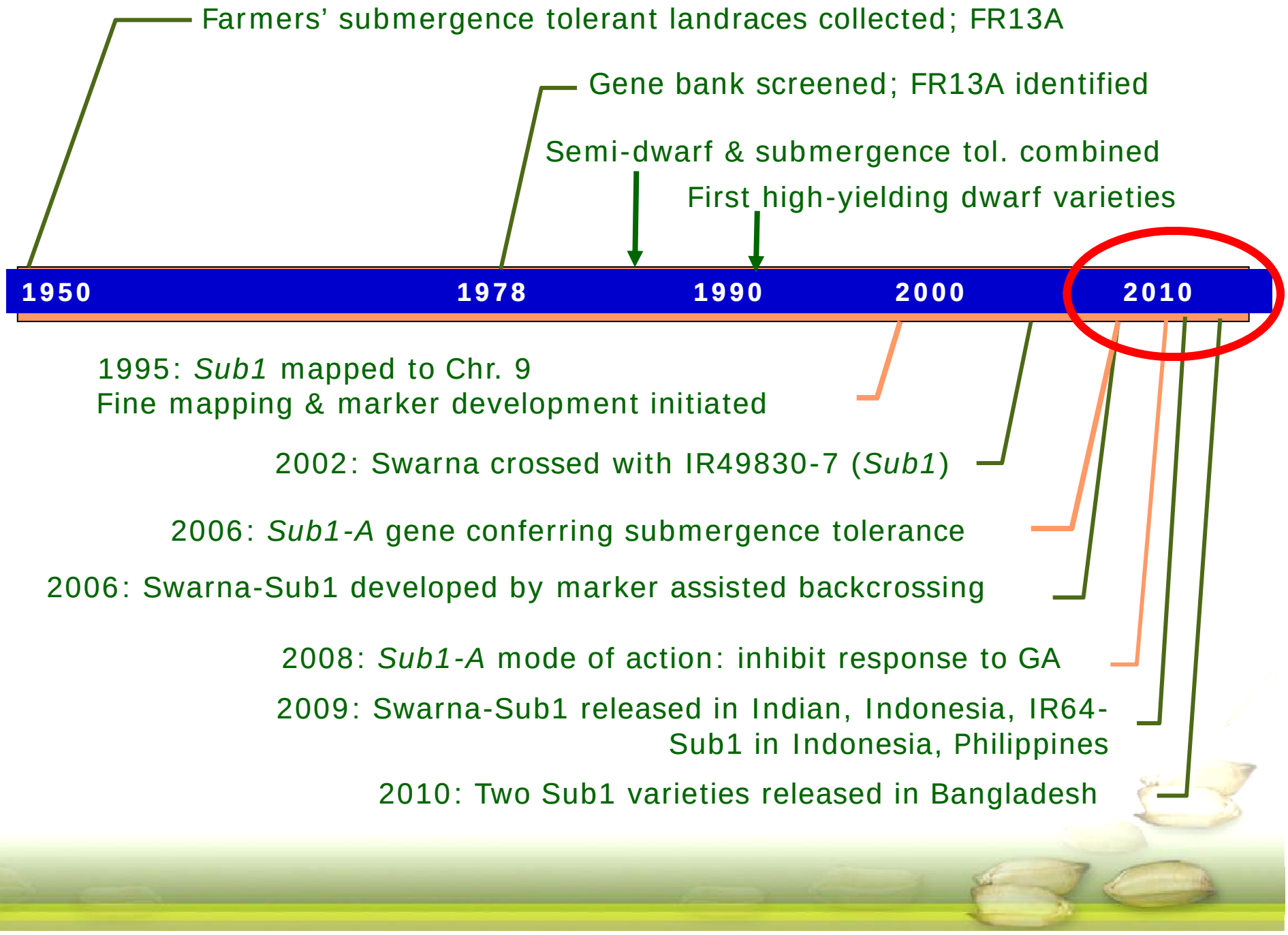
Farmers: 1000s 10.000s 100.000s millions

Timeline

Product: Submergence-tolerant rice



> 25 years of ‘discovery science’: gene, markers,…


Farmers' submergence tolerant landraces collected; FR13A
Gene bank screened; FR13A identified
Semi-dwarf & submergence tol. combined
First high-yielding dwarf varieties
1950
1978
1990
2000
2010
1995: Sub1 mapped to Chr. 9
Fine mapping & marker development initiated
2002: Swarna crossed with IR49830-7 (Sub1)
2006: Sub1-A gene conferring submergence tolerance
2006: Swarna-Sub1 developed by marker assisted backcrossing
2008: Sub1-A mode of action: inhibit response to GA
2009: Swarna-Sub1 released in Indian, Indonesia, IR64-Sub1 in Indonesia, Philippines
2010: Two Sub1 varieties released in Bangladesh

Swarna-Sub1 Timeline in in India and B'Desh

Partners	NARES (2)	NARES (8)	+ NGOs, FOs, Seed Co (P) (22)	+ NFSM, State Govs., Seed Co (P&Pv), NGOs, IPs (54)	100 public & private sector	>130 public & private sectors
	2006	2007	2008	2009	2010	2011	2012
Activities	Multiplication	Evaluation	Evaluation, Demonstration	Release (June), Seed Mult. (BS	Dissemination, adoption, tacking impact assessment		
Seed amount	2 kg	100 kg					BS/FS/ CS/TL, 40000 t (+FS)
No. of Farmers						3 mil	4.0 mil

Breeding status **Africa** 2011: sub1 works in elite African rice germplasm

- WITA 4 x Swarna *sub1* BC2F1
- NERICA L-19 x IR64 *sub1* F1
- FARO 57 x Swarna *sub1* BC1F1

October 2012: urgent request from Nigerian Minister of Agriculture for submergence tolerant rice

Swarna-Sub rmers in India and y 2012

New Products: “2 in 1”
Submergence + salinity tolerance

12 million ha salt affected

10 days submerged in saline water

Sub1 only **SalTol+ Sub1**

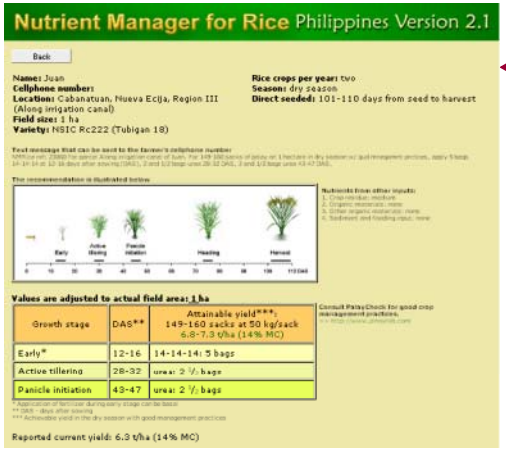
Product: Nutrient-management advice

Web

Smartphone

GSM mobile

Local Language real time interaction



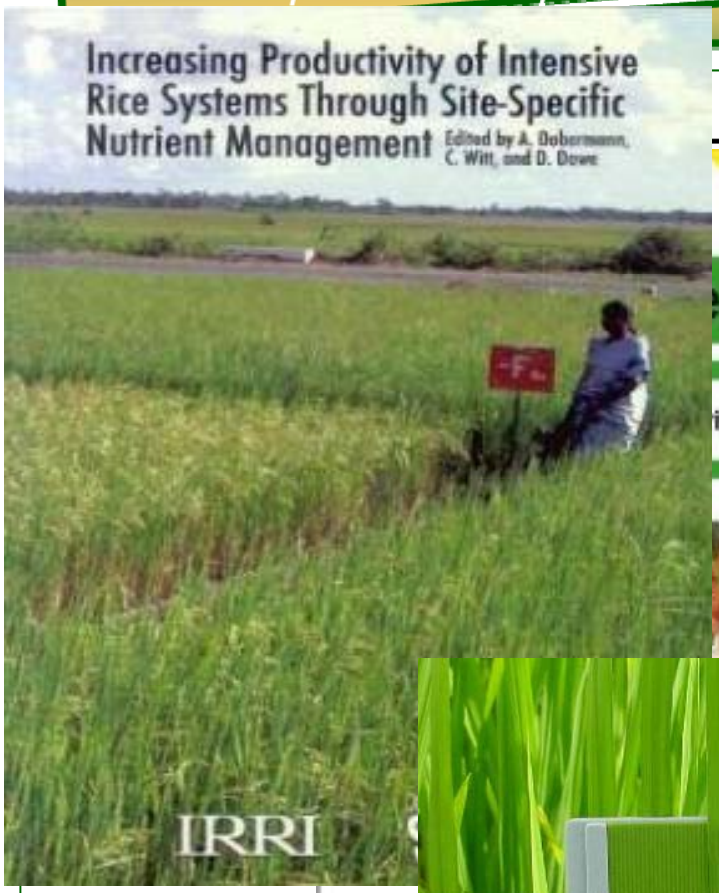
Web and smart phone output

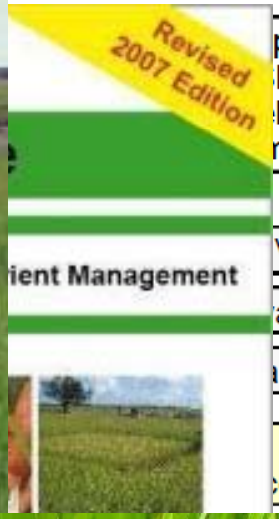
SMS output

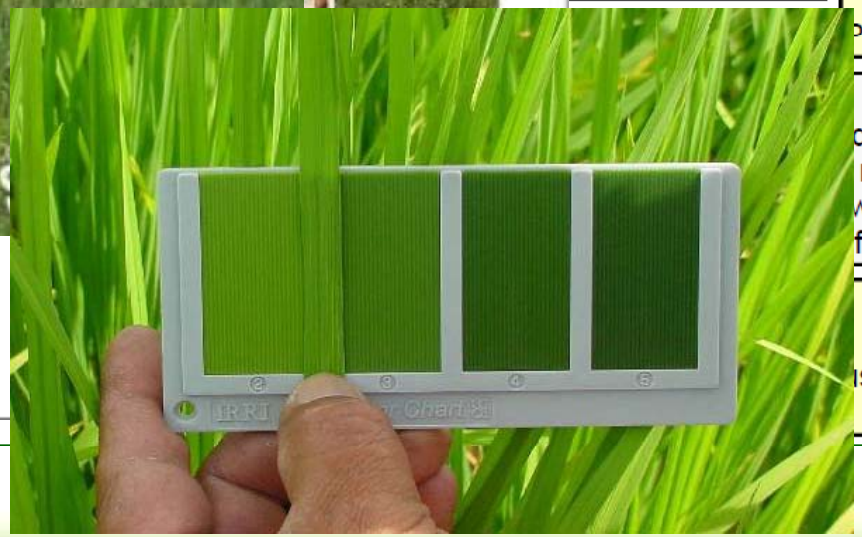
Indonesia, Philippines: farmers increase returns 100$ per ha

Science partnerships

Development partnerships







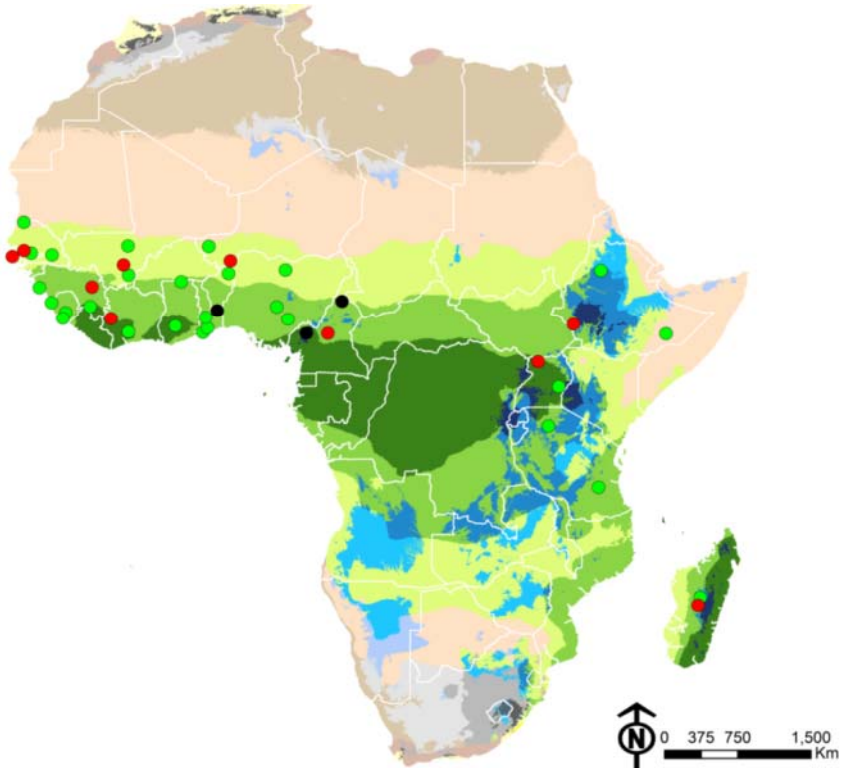
	2005	2010	2015	2020
	ples of NM loped maize	Mobile phone & Web-based SSNM decision tools	SSNM tools integrated into value chain	SSNM & crop management integrated across value chain
	Vietnam for rice		SE & S Asia, W & E Africa for rice	
	anmar for rice		Indo-Gangetic Plains for rice-wheat	
	for maize		Bangladesh, India, SE Asia, Africa for maize	
	private sector in 8 countries		NARES, local government, private sector, NGOs in Bangladesh, China India, Indonesia, Nepal, Myanmar, Philippines, Vietnam; W, E, and S Africa	
			IT-based SSNM decision tools for rice, maize, and wheat: 2015: >20 for >15 countries	IT-based crop management tools for systems: 2020: national use in >10 countries
Adoption levels achieved			2015: SSNM-based practices used by >3 million farmers	2020: SSNM with improved crop management used by >10 million farmers

Moving into Africa (2011-…)

Development step 2012	Progress
Collection of nutrient omission and fertilizer response data in farmers' fields	Benin, Burkina Faso, Niger, Nigeria
Calibration of the underlying model for given rice domains	
Development of domain-specific questionnaires with 15 to 20 simple questions	
Programming of country- or domain-specific software versions of NMR	
Development of ICT applications (web, mobile & android smartphone) that quickly reach rice growers and extension workers	Mali, Ghana
Small-scale evaluation of the NMR recommendation vs. farmers' practice	Senegal
Large-scale testing	
Dissemination	

Target Domains

Development outcomes: more than genes…



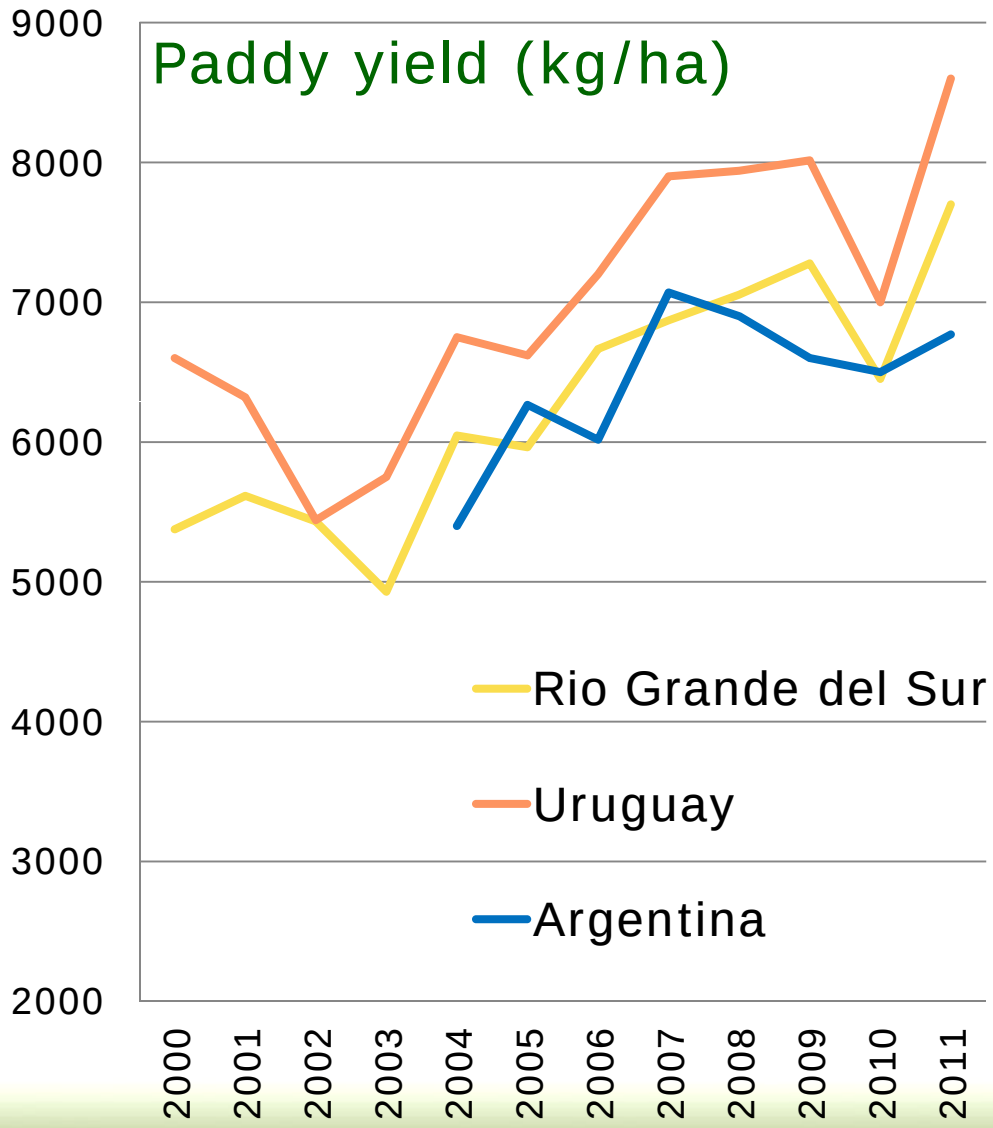
Rice development hubs: co-owned testing grounds for development and delivery of new rice technologies

Labor shortage: mini combines introduced

Labor shortage and yield increase: weeding tools introduced

Local market needs: improved rice processing and packaging

South-American “Agronomy Revolution”



- Service-oriented advisory systems focused on integrated and efficient management
- Focus on cropping systems approach
- Cross-country learning

Particular attention to women stakeholders

Burundi: ex-combatant women trained in novel rice farming technologies

“We are able to buy soap, nice cloths, we wash cloths, ... and

we also have more food now: in my family for example, we were eating only once a day, in the morning or at noon. Now we eat twice a day”

GRiSP key take-home messages

- Global challenges require globally concerted action => GRiSP

- GRiSP inclusively develops and delivers science-based products and services (more than genes), along with evolving partnerships, that make a change through well-defined Impact-Pathways

- Development of new products takes time: continuous and long-term investment is needed to 'harvest' the impacts

Ancient Chinese Proverb:

There are two best times to plant a tree:

"The first is twenty years ago
and the second is today"

CGIAR

Research Program on Rice

Global Rice Science Partnership

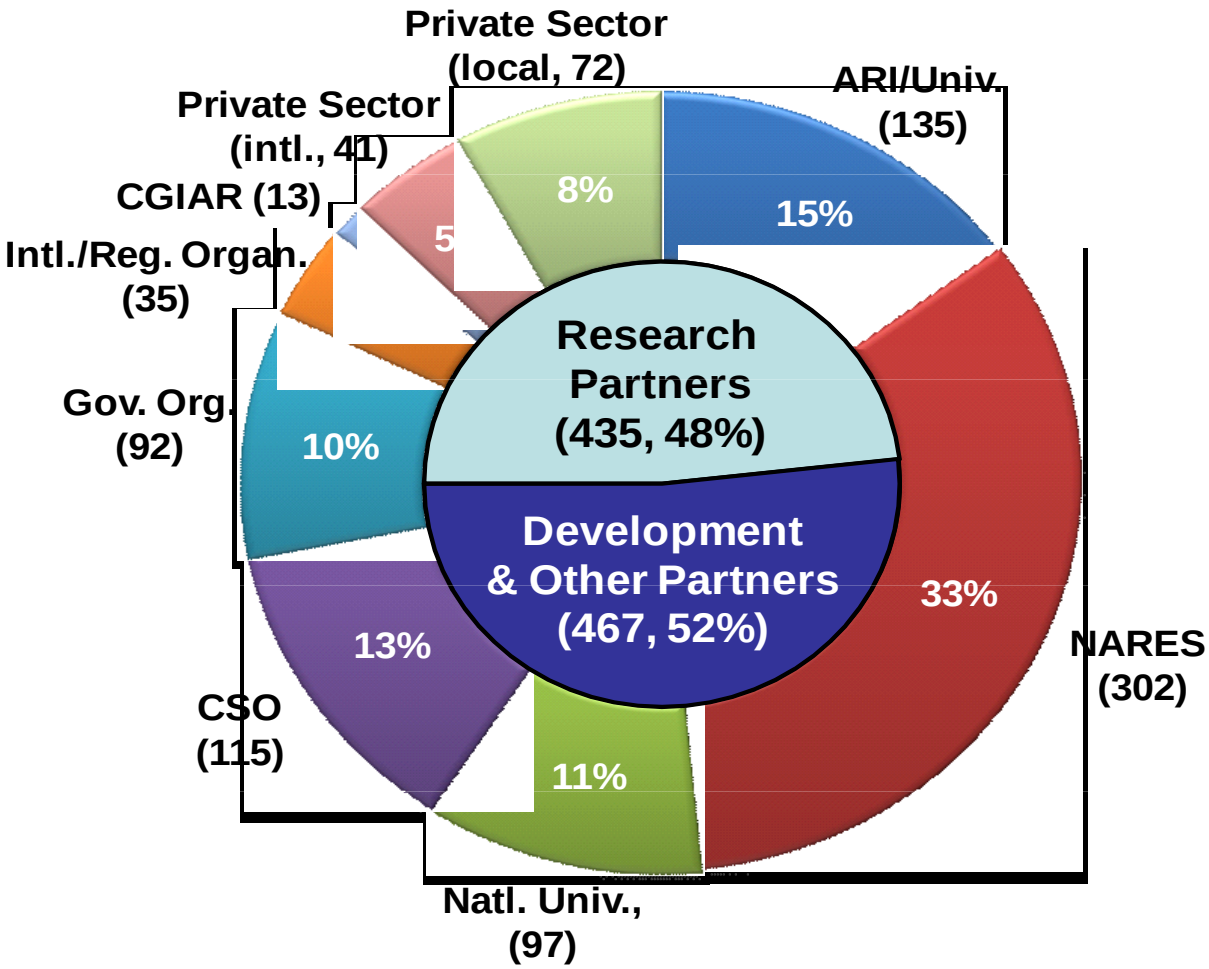
What's new?

- First-time ever globally concerted action
- Well-defined Impact-Pathway
- Alignment of major R4AD international institutions and their partners spanning the 'science-development' continuum; reduced redundancy, gap filling, capturing and synthesizing global efforts – enhanced value added
- Exchange of knowledge, information, tools, germplasm, genes, methods, data,…
- Collaborative efforts (eg global phenotyping platform)
- Weighty impact/policy influence because of global scope
- Bringing together partnerships, networks, consortia

Special/unique features

- Competitive New Frontier projects and new initiatives
- Competitive Scholarships (GRISS)
- Global Forum
- High-level advisory panel
- Multi-institutional scientific teams across globe
- Partnership development fund
- Asian leadership training for women
- Enhanced capacity building

A Global Rice Science Partnership



Objectives of GRiSP

- To increase rice productivity through development of improved varieties and other technologies along the value chain
- To foster more sustainable rice-based production systems that use resources more efficiently
- To improve the efficiency and equity of the rice sector through better and more accessible information and strengthened delivery mechanisms

New Products *"Rebooting evolution"*

Useful Traits

- *Insect resistance*
- *Disease resistance*
- *Tolerance of abiotic stresses*
- *QTLs for yield*
- *Nutrition?*
- *Industrial uses?*

Wild Species of *Oryza: truly global resource*

Transfer of natural salt tolerance from *Oryza coarctata* a wild species that grows well in brackish water